UNITED STATES DISTRICT COURT

NORTHERN DISTRICT OF CALIFORNIA

THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, ABBOTT MOLECULAR INC., and ABBOTT LABORATORIES, INC.,

Plaintiffs,

v.

DAKO NORTH AMERICA, INC. and DAKO DENMARK A/S,

Defendants.
_____/

No. C 05-03955 MHP

MEMORANDUM & ORDER

Re: Plaintiffs' Motion for Summary Judgment of Infringement

The Regents of the University of California, Abbott Molecular Inc. and Abbott Laboratories Inc. (collectively, "plaintiffs") filed this action against Dako North America, Inc. and Dako Denmark A/S (collectively, "Dako" or "defendants"), alleging infringement of two United States patents related to *in situ* DNA hybridization. Now before the court is plaintiffs' motion for summary judgment of infringement of the one remaining patent in suit, United States Patent No. 5,447,841 ("the '841 patent"), under the doctrine of equivalents. Having considered the arguments and submissions, and for the reasons set forth below, the court enters the following memorandum and order.

BACKGROUND

Because the parties' background, the technology at issue and the procedural history of the case have been reviewed in numerous prior orders issued by this court, only a brief summary is needed here. Further details can be found in prior orders. See, e.g., Regents of Univ. of Cal. v. DakoCytomation Cal., 2006 WL 618769 (N.D. Cal. 2006), Docket No. 81 ("PI Order"), Regents of

Univ. of Cal. v. DakoCytomation Cal., 2006 WL 1343950 (N.D. Cal. 2006), Docket No. 110 ("Amended PI Order"), Regents of Univ. of Cal. v. Dako N. Am., Inc., 2006 WL 1867618 (N.D. Cal. 2006), Docket No. 164 ("Claim Construction Order"), and Regents of Univ. of Cal. v. Dako N. Am., Inc., 448 F. Supp. 2d 1145 (N.D. Cal. 2006), Docket No. 178 ("First SJ Order"), aff'd in part and rev'd in part, 517 F.3d 1364 (Fed. Cir. 2008), Regents of Univ. of Cal. v. Dako N. Am., Inc., 2009 WL 1083446 (N.D. Cal. 2009), Docket No. 353 ("Second SJ Order").

The technology in this case pertains to diagnostic tools that detect genes using DNA hybridization methods. In DNA hybridization, sections of nucleic acid that are labeled, usually with a fluorescent dye ("hybridization probes"), are bonded to complementary "target" regions of chromosomal DNA—typically, sections which encode a protein of interest. See, e.g., '841 patent at cols. 2–3. The fluorescent label provides visual confirmation of the presence of the target gene. Id. Dako manufactures and sells diagnostic kits which make use of *in situ* hybridization to determine the presence and frequency of certain genes of interest. Plaintiffs allege that Dako infringes its methods of staining chromosomal DNA by a method that uses blocking probes in *in situ* hybridization, as claimed in the '841 patent.

I. The '841 Patent

The '841 patent teaches a method of detecting unique DNA sequences on specific chromosomes in *in situ* hybridization through the use of "blocking nucleic acid" so that labeled repetitive nucleotide sequences are substantially blocked from binding to the chromosomal DNA. '841 patent at 17:4–18:27. The '841 patent serves to disable the hybridization capacity of repetitive sequences so that signal from the intended target is not overwhelmed by nonspecific background staining or "noise." Id. at col 4:47-51. By reducing the undesired staining of repetitive sequences, signal from labeled probes bound to the target sequence of interest can then be distinguished over any background noise in a single cell on a single chromosome. Id. at 9:58–10:13. Each of the '841 patent claims is directed to this method of staining chromosomal DNA, using labeled probes and blocking nucleic acids to permit detection (i.e., with acceptable signal-to-noise ratios) of unique DNA sequences.

There are 17 claims at issue for the '841 patent. Claim 1, the only independent claim of the '841 patent, claims as follows:

> A method of staining target chromosomal DNA comprising:
>
> > (a) providing 1) labeled nucleic acid that comprises fragments which are substantially complementary to nucleic acid segments within the chromosomal DNA for which detection is desired, and 2) blocking nucleic acid that comprises fragments which are substantially complementary to repetitive segments in the labeled nucleic acid; and
> >
> > (b) employing said labeled nucleic acid, blocking nucleic acid, and chromosomal DNA in in situ hybridization so that labeled repetitive segments are substantially blocked from binding to the chromosomal DNA, while hybridization of unique segments within the labeled nucleic acid to the chromosomal DNA is allowed, wherein blocking of the labeled repetitive segments is sufficient to permit detection of hybridized labeled nucleic acid containing unique segments, and wherein the chromosomal DNA is present in a morphologically identifiable chromosome or cell nucleus during the in situ hybridization.

Id. at 17:4–25.

Dependent claims 2 through 5 recite the order in which the blocking nucleic acid is hybridized with the labeled nucleic acid and the chromosomal DNA. Dependent claims 6, 8–9 and 11 further characterize the labeled nucleic acid. Claim 6, for example, claims "wherein the labeled nucleic acid comprises fragments which are designed to allow detection of extra or missing chromosomes, extra or missing portions of a chromosome, or chromosomal rearrangements." Id. at 18:1–5. Claim 11 depends from claim 1 and claims the labeled nucleic acid comprising "fragments complementary to the total genomic complement of chromosomes, fragments complementary to a single chromosome, fragments complementary to a subset of chromosomes, or fragments complementary to a subregion of a single chromosome." Id. at 18:16–22. Claims 8 and 12 limit the nucleic acid to human chromosomal DNA. Id. at 18:8–11; 18:23–25. Dependent claims 14–17 further characterize the repetitive segments.

II. The Accused Products

At issue are twenty-nine Dako diagnostic kits which make use of *in situ* hybridization to detect certain genes of interest. See Joint Statement of Undisputed Facts Re NonInfringement, Docket No. 298, ("Undisputed Noninfringement Facts") ¶ 15. Each accused product includes a labeled nucleic acid that comprises fragments which are substantially complementary to nucleic acid

segments within the chromosomal DNA for which detection is desired. Joint Statement of Undisputed Facts Re Infringement, Docket No. 294, ("Undisputed Infringement Facts") ¶ 2. Each accused product also includes unlabeled blocking peptide nucleic acid ("PNA") probes. Id. ¶ 3. The unlabeled blocking PNA probes comprise fragments that are substantially complementary to portions of repetitive segments in the labeled nucleic acid. Id. ¶ 4. The unlabeled PNA probes serve to block labeled repetitive sequences from binding to chromosomal DNA, in a manner sufficient to permit detection of hybridized labeled nucleic acid containing unique segments. Id. ¶¶ 6–7. Of the twenty-nine accused products, all but the *HER2 and TOP2A* fluorescent *in situ* hybridization ("FISH") pharmDx™ kits also include sonicated total human DNA in addition to unlabeled PNA blocking probes. Undisputed Noninfringement Facts ¶ 17.

PNA is a synthetic man-made molecule. Harper Dec. Re Infringement, Docket No. 267, ¶ 19. Although PNA has been referred to as a DNA "mimic," because it contains the same nucleobases and follows the same sequence-specific recognition and base-pairing rules as natural nucleic acids, PNA has a polyamide backbone that is different from the backbone of natural nucleic acids. Undisputed Infringement Facts ¶¶ 16–18. As a result of these properties, PNA is able to hybridize with complementary nucleic acid sequences, but PNA probes bind more tightly to complementary nucleic acid sequences than DNA or RNA probes of equivalent length and sequence. Harper Dec. ¶¶ 19 & 24.

III. Relevant Procedural History

This action has been before the Federal Circuit on the issues of this court's denial of a preliminary injunction order and the partial grant of Dako's motion for summary judgment of noninfringement of the '841 patent with respect to two of its accused products. See First SJ Order at 18. In a February 28, 2008 decision, the Federal Circuit affirmed the denial of a preliminary injunction and reversed the grant of summary judgment of noninfringement as to the '841 patent for the two products. See Regents of Univ. of Cal. v. Dakocytomation Cal., Inc., 517 F.3d 1380 (Fed. Cir. 2008). As to the reversal of noninfringement, the Federal Circuit held that plaintiffs were not precluded by prosecution history estoppel from asserting that Dako's accused synthetic nucleic acids, i.e., PNAs, were equivalents that infringed the '841 patent. Id. at 1376–78. The Federal

Circuit held that a narrowing amendment which surrendered all equivalents to "blocking nucleic acid" was directed at the blocking method, not the type of nucleic acid. Id. Because the narrowing amendment to "blocking nucleic acid" was deemed only tangential to the accused PNA equivalent, the Federal Circuit held that plaintiffs could maintain their claim that Dako's products infringe under the doctrine of equivalents. The court reversed and remanded, stating "[w]hether they do infringe is a question of fact for the trial court to consider on remand." Id. at 1378.

LEGAL STANDARD

I. Summary Judgment

As in any other civil action, summary judgment is proper in a patent infringement action when the pleadings, discovery and affidavits show that there is "no genuine issue as to any material fact and that the moving party is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c); see also Southwall Techs., Inc. v. Cardinal IG Co., 54 F.3d 1570, 1575 (Fed. Cir. 1995). Material facts are those which may affect the outcome of the case. Anderson v. Liberty Lobby, Inc., 477 U.S. 242, 248 (1986). A dispute as to a material fact is genuine if there is sufficient evidence for a reasonable jury to return a verdict in favor of the nonmoving party. Id. The party moving for summary judgment bears the burden of identifying those portions of the pleadings, discovery and affidavits that demonstrate the absence of a genuine issue of material fact. Celotex Corp. v. Catrett, 477 U.S. 317, 323 (1986). On an issue for which the opposing party will have the burden of proof at trial, the moving party need only point out "that there is an absence of evidence to support the nonmoving party's case." Id.

Once the moving party meets its initial burden, the nonmoving party must go beyond the pleadings and, by its own affidavits or discovery, "set forth specific facts showing that there is a genuine issue for trial." Fed. R. Civ. P. 56(e). Mere allegations or denials do not defeat a moving party's allegations. Id.; Gasaway v. Nw. Mut. Life Ins. Co., 26 F.3d 957, 960 (9th Cir. 1994). The court may not make credibility determinations, and inferences to be drawn from the facts must be viewed in the light most favorable to the party opposing the motion. Masson v. New Yorker Magazine, 501 U.S. 496, 520 (1991); Anderson, 477 U.S. at 249.

II. Patent Infringement

Patent infringement may be proven by showing literal infringement of every limitation recited in a claim or by showing infringement under the doctrine of equivalents. See Linear Tech. Corp. v. Impala Linear Corp., 379 F.3d 1311, 1318 (Fed. Cir. 2004). Both literal infringement and infringement under the doctrine of equivalents require an element-by-element comparison of the patented invention to the accused device. Warner-Jenkinson Co. v. Hilton Davis Chem. Co., 520 U.S. 17, 40 (1997). When the patented invention is being compared to the accused device under the doctrine of equivalents, the court should consider "whether a substitute element matches the function, way, and result of the claimed element, or whether the substitute element plays a role substantially different from the claimed element." Id.

Determination of patent infringement is a two step process: first, the court must determine as a matter of law the meaning of the particular patent claim or claims at issue; and second, it must consider whether the accused product infringes one or more of the properly construed claims. Markman v. Westview Instruments, Inc., 517 U.S. 370, 384 (1996); see also Allen Eng'g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1344 (Fed. Cir. 2002). The second inquiry is a question of fact and summary judgment of infringement or noninfringement is only appropriate when no genuine dispute of material fact exists. Irdeto Access, Inc. v. Echostar Satellite Corp., 383 F.3d 1295, 1299 (Fed. Cir. 2004), quoting Bai v. L & L Wings, Inc., 160 F.3d 1350, 1353 (Fed. Cir. 1998).

The rights granted to a patent holder are defined by the patent's claims. Markman, 517 U.S. at 373. It is a "well-established rule that subject matter disclosed but not claimed in a patent application is dedicated to the public." Maxwell v. J. Baker, Inc., 86 F.3d 1098, 1106 (Fed. Cir. 1996).

DISCUSSION

I. Supplemental Claim Construction

Before the court proceeds with the infringement determination, it must note the status of claim construction with regard to the term "blocking nucleic acid." The court did not construe this term present in the sole independent claim 1 of the '841 patent. Rather, the parties agreed to a

stipulated construction of the term, pursuant to the Patent Local Rules. According to this agreed construction, the term "blocking nucleic acid" means "fragments of repetitive-sequence-enriched DNA or RNA." See Joint Claim Construction and Prehearing Statement, Docket No. 83, at 2:7–8.

Later, a dispute arose with regard to this construction. Specifically, Dako asserted that total human DNA did not fall within the claim limitation because it is not enriched in any way and because applicants distinguished between distinguished between total human DNA and repetitive-sequence-enriched DNA during prosecution of the '841 patent. By contrast, plaintiffs contended that the ordinary and customary meaning of "blocking nucleic acid" includes total human DNA, and that once total human DNA is fragmented into pieces for use in the claimed blocking method, there is a low fraction of relevant unique sequences as compared to relevant repeat sequences, so it is also "repetitive-sequence-enriched" per se. The court requested supplemental claim construction briefing on the issue, and before the scheduled hearing, the parties once again reached an agreement as to a stipulated construction of the claim term in dispute. See Stipulation and Order re Supplemental Claim Construction, Docket No. 351.

Under the new stipulation, the parties agree that "blocking nucleic acid" means "nucleic acid used to prevent hybridization of repetitive sequences in the labeled nucleic acid to the chromosomal DNA." Id. at 2:8–10 and 6:4–6. This new construction rendered several pending motions moot, including Dako's motion for partial summary judgment of noninfringement. The parties agreed that plaintiff's pending motion for summary judgment of infringement would proceed under this construction. The court turns to this issue.

II. Plaintiffs' Motion for Summary Judgment of Infringement

There is no dispute that Dako's products do not literally infringe the '841 patent. Nor is there any dispute, as the Federal Circuit previously ruled, that plaintiffs are not barred by prosecution history estoppel from asserting that Dako's PNAs are equivalents that infringe the '841 patent. See Dakocytomation, 517 F.3d at 1376–78. Plaintiffs now move for summary judgment of infringement with respect to all twenty-nine of Dako's accused products, on the ground that Dako's use of blocking PNA meets the claim limitation of a "blocking nucleic acid" under the doctrine of equivalents.

Equivalency for infringement purposes "requires determination of whether the accused composition is only insubstantially changed from what is claimed." Viskase Corp. v. Am. Nat'l Can Co., 261 F.3d 1316, 1324 (Fed. Cir. 2001). One way to determine equivalency is by the "function-way-result" test—showing that the accused product and the claimed invention perform substantially the same function, in substantially the same way, to achieve substantially the same result. Id., citing Warner-Jenkinson, 520 U.S. at 40. Although equivalence is "a factual matter normally reserved for a fact-finder," the court may grant summary judgment where no reasonable fact-finder could find or fail to find equivalence. See Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1423 (Fed. Cir. 1997); see also Abbott Labs. v. Novopharm Ltd., 323 F.3d 1324, 1329 (Fed. Cir. 2003).

Twenty-seven of Dako's accused products use a combination of unlabeled total human DNA and unlabeled blocking PNA. The other two accused products (Dako's *HER2 and TOP2A* FISH pharmDx™ kits) use only unlabeled blocking PNA to perform a blocking function. Plaintiffs contend that Dako's blocking PNA is equivalent to blocking nucleic acid, because blocking PNA performs substantially the same function in substantially the same way to obtain substantially the same result as the claimed "blocking nucleic acid" limitation in the '841 patent. Plaintiffs also contend that the combination of total human DNA with blocking PNA is equivalent to the claimed blocking nucleic acid limitation, and any differences between PNA and traditional nucleic acid are irrelevant and insubstantial. Dako, however, contends that PNAs are markedly different from naturally occurring nucleic acids and that these differences raise a genuine issue of material fact as to whether the blocking PNAs of the accused products, either alone or in combination with total human DNA, function in substantially the same way as the blocking nucleic acids claimed by the '841 patent.

A Plaintiffs' Argument

Plaintiffs assert that all of Dako's accused products infringe the '841 patent under the doctrine of equivalents because each of the accused products uses unlabeled PNA to "block labeled repetitive sequences from binding to chromosomal DNA," see Undisputed Infringement Facts ¶ 6, and this is insubstantially different from "nucleic acid used to prevent hybridization of repetitive sequences in the labeled nucleic acid to the chromosomal DNA."[1] On oral arguments, plaintiffs

further asserted that the mixture of total human DNA enriched with PNA is also equivalent to, and insubstantially different from, "blocking nucleic acid" under this stipulated construction.[2]

As the party moving for summary judgment, plaintiffs bear the burden of demonstrating the absence of a genuine issue of material fact. Celotex, 477 U.S. at 323. In support of their motion, plaintiffs submitted expert testimony from Dr. Mary Harper that synthetic PNA is insubstantially different from natural nucleic acids. In her supplemental declaration, Dr. Harper testified that PNAs are interchangeable with natural nucleic acids because PNA is capable of hybridizing through sequence-specific complementary base-pairing (A binding to T and G binding to C). See Harper Dec., ¶¶ 8 & 19. Dr. Harper testified that the base sequences on one PNA strand will hybridize to a complementary sequence of bases on an opposite strand in the same way that a natural nucleic acid strand would. As a result, PNA is capable of the same binding of DNA as natural nucleic acids. Id., Exh. D at 1041, Exh. E at 1.

Plaintiffs rely on Dr. Harper's testimony to support the contention that the PNA in Dako's accused products functions in the same way as the blocking nucleic acid of the '841 patent, to block repetitive sequences in its labeled DNA probes from binding to the chromosomal DNA during *in situ* hybridization. PNAs function by hybridizing to complementary "Alu" sequences—the most frequent repetitive element with and around genes—in both the labeled probes and chromosomal DNA, to reduce non-specific binding of the labeled probes. Harper Dec. ¶ 23. It is then undisputed, according to plaintiffs, that Dako's PNAs achieve the same result as the "blocking nucleic acid" of the claimed invention because the blocking of labeled repetitive sequences by the unlabeled PNA blocking probes in each of Dako's accused products, alone or in combination with total human DNA, is sufficient to permit detection of hybridized labeled nucleic acid containing unique segments. See Undisputed Infringement Facts ¶ 7. See also, Harper Dec., Exh. J at 238, 244-45, Figs. 5-6 and Exh. I at ¶ 199. Plaintiffs conclude that Dako's accused products infringe the asserted claims by equivalence and any differences outside the context of the claim limitations are irrelevant for an equivalence analysis.

B. Defendants' Argument

Dako's arguments opposing summary judgement generally consist of allegations that other properties of PNA, such as differences in thermal stability, higher binding specificity and the ability to form unique triplex structures, render it not interchangeable with natural nucleic acids like DNAs. For these reasons, Dako argues, its PNA probes do not function in substantially the same way as the claimed blocking nucleic acid, and thus the "way" prong of the function-way-result test for equivalence must fail.

Dako has presented evidence from Dr. James Coull that PNA is not interchangeable with natural nucleic acid.[3] See Coull Dec. ISO Def.'s Opp. re Infringement, Docket No. 297. Although PNA, like natural nucleic acid, is able to hybridize to DNA and RNA using the same nucleobases, Coull asserts that PNA is not actually a nucleic acid (nor is it a peptide) and it has no functional groups in common with nucleic acids. Id. ¶ 17, citing Exhs. G & I. PNA thus differs from natural nucleic acid with respect to various physico-chemical properties such as binding affinity and specificity. Id. ¶ 30. For example, PNA probes bind more tightly and specifically than DNA probes of the same length and sequence, so that fewer PNA probes of shorter length can be used to achieve the same results as longer DNA probes at higher concentrations. Id., Exh. B at 8. This is due, in part, to the ability of PNA probes to form unique binding modes, such as triplex structures, which display enhanced sequence affinity and specificity relative to natural nucleic acids. Id. ¶¶ 26–28. Accordingly, Dako's PNA probes are short—about 20 bases, much shorter than natural nucleic acid sequences used for blocking, which are typically about 200 to 500 bases in length. Coull Dec. ¶¶ 13 & 20.

Plaintiffs contend that the existence of PNA's own physico-chemical properties that confer unique binding modes is an irrelevant difference, because PNA probes can also bind to target sequences in the same way as natural nucleic acids do, and because there is no suggestion that Dako's PNA probes exhibit these additional binding modes in the context of the blocking method of the '841 patent. Harper Dec. ¶¶ 25–33. However, Coull contends that one of Dako's accused products uses a PNA probe made of two PNAs linked together ("cationic-bis-PNA"), and that

similarly constructed PNA probes have been found to form triplex structures and display enhanced affinity and specificity. Coull Dec. ¶ 26.

Coull also contends that the way in which Cot-1 DNA (an undisputed type of "blocking nucleic acid" and one of the preferred embodiments disclosed in the '841 patent) or total human DNA functions is different from the way in which PNA functions in blocking. Cot-1 DNA and total human DNA contain repetitive sequences (Cot-1 DNA, for example, is enriched in Alu and L1 repetitive sequence elements as well as other repetitive sequences) as well as unique sequences. Coull Dec. ¶¶ 14 & 22. As a result, these DNAs indiscriminately block all repetitive sequences as well as some unique sequences. Id. ¶¶ 12 & 14. Dako's PNA probes, on the other hand, are specifically designed to bind to twelve common sequences found in most Alu repeats. Id. ¶ 19.

According to Dako, the presence of unique sequences in Cot-1 DNA contributes to the different way in which Cot-1 DNA functions in hybridization reactions as compared to a synthetic probe like PNA. Unique sequences promote the formation of non-specific associations between labeled probe and chromosomal DNA, distorting the quantitative measurement of the desired specific hybridization and weakening the specific signals in assays such as FISH assays. Id. ¶ 24. Furthermore, Dako's PNA probes only hybridize to a fraction of the available Alu DNA sequence (about 35%). Because Alu sequence makes up only 10% of all sequences in the genome, Dako's Alu PNA probes therefore only cover about 3.5% of the entire genomic sequence. Id. ¶ 21. In contrast, Cot-1 DNA covers about 45% of the entire genomic sequence. Id. ¶ 22. Plaintiffs again contend these differences are of no moment, because the '841 patent does not require the "blocking nucleic acid" to block *all* repetitive sequences and PNA blocking of repetitive sequences is sufficient to permit detection of the hybridized labeled unique sequence probes. See '841 patent claim 1.

Finally, Dako cites a comparative experiment conducted by Coull between Dako's PNA probes and DNA probes. Alu-DNA probes were designed that were of the same length and sequence as Dako's PNA probes, and both sets of probes were used at the same concentration. Coull Dec., Exh. B at 13-25. Coull found that PNA probes produced very different results, with PNA probes suppressing cross-hybridization and reducing background staining more effectively than the DNA probes. Id. at 24-25. Based on the clear difference in results and the fact that the only

difference was the replacement of PNA with DNA, Coull concluded that the blocking PNA functioned in a different way than the blocking DNA. Coull Dec. ¶ 29. Because the Alu-DNA in Coull's experiment is "in essence Cot-1 DNA or any commonly used repetitive-sequence-enriched DNA from a number of longer and/or different sequences have been removed," Dako's PNA probes therefore also function in a different way than Cot-1 DNA. Id. ¶ 30. Plaintiffs parry by asking the court to disregard these experiments, because they do not compare the alleged equivalent to the "blocking nucleic acid" as claimed.

C. Equivalence Determination

In considering the parties arguments, the court is mindful that "[i]nfringement, whether literal or under the doctrine of equivalents, is a question of fact." Terlep v. Brinkmann Corp., 418 F.3d 1379, 1382 (Fed. Cir. 2005). The Supreme Court has acknowledged that "the doctrine of equivalents renders the scope of patents less certain" and "[i]t may be difficult to determine what is, or is not, an equivalent to a particular element of an invention." Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co., Ltd., 535 U.S. 722, 732 (2002). Indeed, the court finds these sorts of difficulties arising here, due in no small part to the new stipulated claim construction of "blocking nucleic acid," given that Dako's allegedly infringing use of PNA in its accused products hinges on the construction of that element. Given the discrepancy between the expert testimony and the attorney arguments on this point, the court finds the issue now before it a closer one than might have otherwise been the case.

The main fallacy the court sees with Dako's arguments is that it compares PNA to the preferred embodiments of the '841 patent (e.g., Cot-1 DNA) or to the working example (total human DNA), rather than to the claim. For infringement analysis, whether literal or by equivalence, the proper comparison is between the accused element and the claimed element. Warner-Jenkinson, 520 U.S. at 37 ("the question under the doctrine of equivalents is whether an accused element is equivalent to a claimed element . . . ."). In this case, the dispute over the construction of the claim element itself may have caused Dako to focus on undisputed preferred embodiments disclosed in the patent, such as Cot-1 DNA. In light of the new stipulated claim construction, however, many of Dako's arguments now appear misplaced. Nonetheless, the court presses on.

All of Dako's accused products employ PNA to block the binding of repeat sequence labeled fragments. With two exceptions, each accused product includes unlabeled "total human DNA" as well as unlabeled PNA. It is undisputed that those products make use of the total human DNA to perform a blocking function. Neither party addressed the distinctions between PNA usage alone versus its presence to enrich total human DNA in their briefs, however. On oral argument, when asked, Dako did not dispute that total human DNA falls within the claim term "blocking nucleic acid" as now construed. However, Dako does not agree that the mixture of total human DNA with PNA therefore infringes the claim element, because Dako contends there are genuine issues of fact as to what function the total human DNA is performing in that mixture, i.e., whether it is there to block repetitive sequences or to somehow control non-specific binding in another, as yet undetermined, way. Although Dako's hand-wringing uncertainty as to how total human DNA improves unique sequence detection may stretch the bounds of credibility, it is simply not a proper determination for the court to make on summary judgment. Masson, 501 U.S. at 520.

For the purposes of this motion, Dako simply argues that PNA is not interchangeable with total human DNA in all contexts. For example, unmodified PNA oligomers cannot be used as primers in PCR and other amplification techniques. See Coull Dec., Exh. I at 21. Plaintiffs do not dispute that PNA is not interchangeable with natural nucleic acids for all molecular hybridization applications (perhaps because unmodified PNAs *ipso facto* have no functional group to act with a DNA polymerase), but this fact is of no moment. The proper equivalence analysis concerns "the role played by each element in the context of the specific patent claim" Warner-Jenkinson, 520 U.S. at 40. Things the PNAs may do above and beyond the claimed application is therefore irrelevant for the purposes of this motion.

The case law makes clear that the interchangeability between the claimed and the accused elements must be something that one of ordinary skill in the art would know at the time of infringement. Id at 37. Dr. Harper has testified that in 2005, when Dako began offering its products, a skilled practitioner would have known of the interchangeability of PNAs and natural nucleic acids for use as molecular probes in *in situ* hybridization procedures. Dr. Coull argues that the literature cited by Dr. Harper only shows that PNA was known to be interchangeable for nucleic acid in

labeled probes, not *blocking* probes, and that the differing use of PNAs in these contexts is more than insubstantial. Dr. Coull concludes that while one of skill in the art at the time of infringement might have relied on the interchangeability of PNA for nucleic acid in labeled probes, that is not how the accused products use PNA. A skilled artisan would not have known PNA would also be interchangeable for nucleic acid used to prevent hybridization of repetitive sequences, as required by the claim term "blocking nucleic acid" of the '841 patent.

The court cannot make credibility determinations at this stage, as to which expert correctly speaks for what a skilled artisan would have extrapolated from the use of PNAs as labeled probes in the art at the time Dako began offering its products for sale. However, this disputed issue of fact is not seminal to an infringement determination. Interchangeability is not dispositive as to equivalence, Unidynamics Corp. v. Automatic Products Intern., Ltd., 157 F.3d 1311, 1322 (Fed. Cir. 1998), abrogated on other grounds by Egyptian Goddess, Inc. v. Swisa, Inc., 543 F.3d 665 (Fed. Cir. 2008),

and the function-way-result may still be satisfied to show an accused equivalent constitutes an insubstantial change. See Perkin-Elmer Corp. v. Westinghouse Elec. Corp., 822 F.2d 1528, 1535 (Fed. Cir. 1987) (noting "interchangeability of claimed with unclaimed elements is a factor in considering equivalence . . . yet the accused devices must still perform substantially the same function in substantially the same way to obtain the same result.")

The court's role is limited to determining the existence *vel non* of a genuine issue of material fact, and nothing more. To this end, Dako provides expert testimony that is directed more specifically to the claimed application of PNAs, i.e., that its PNA probes do not function in substantially the same "way" as traditional nucleic acids in *in situ* hybridization assays. The court finds that neither the "function" nor the "result" prong of the function-way-result test remain at issue. Plaintiffs have met their burden of production to demonstrate the absence of any genuine issues of material fact on these prongs, notably, by relying in large part on undisputed facts, and Dako has failed to come forward with supplementary evidence that presents a sufficient disagreement to require submission to a jury. Celotex, 477 U.S. at 322.

However, such is not the case for the "way" prong. There, Dako presents expert testimony from Dr. Coull that PNA has unique properties and unique binding modes that affects the way in which it binds to, and blocks, labeled repetitive segments. Unlike repetitive-sequence-enriched DNA that indiscriminately binds all repetitive sequences, Dako's blocking PNA probes bind to only a short sub-sequence of one type of repetitive sequence. Unlike Cot-1 DNA or total human DNA that requires tuning to determine the proper amount of DNA in order to generate a high contrast with acceptable levels of specific staining, Dako's blocking PNA doesn't require such tuning. According to Dr. Coull, PNA is more efficient and so it is able to sufficiently block hybridization capacity without the additional coverage of repetitive sequences that Cot-1 or total human DNA provides.

This testimony will preclude a finding of equivalence only if these differing attributes are relevant to the role played by "blocking nucleic acid" as claimed, i.e., the way the blocking nucleic acid is designed to function in the context of the '841 patent. Plaintiffs essentially argue the claimed blocking "way" is constrained by nothing beyond the fact that it blocks repetitive sequences to permit detection of unique sequences.[4] Given the breadth of this asserted claim element, plaintiffs' briefs seem to rest on the presumption that the range of equivalents should be accordingly wide. The court finds this to be an improvident assumption at this stage of the proceedings.

Plaintiffs assert that Dako fails to provide a definition of the way in which "blocking nucleic acid" functions, but so do plaintiffs fail to present their position on the way in which the '841 patent achieves its result. At this stage, therefore, the court is incapable of holding that Dako's PNAs function in substantially the same way as the claimed "blocking nucleic acid." Dr. Coull's testimony raises at least one genuine issue of fact as to whether Dako's PNA probes form triplex structures in the course of blocking and thus display enhanced sequence affinity and specificity. Plaintiffs' assertions that improvements on the claimed subject matter by the accused products do not matter for an equivalence determination are inappropriate at this stage, given the issues of material fact that have been raised with regard to the way the PNA functions at all. The court cannot determine at this stage whether Dako's PNAs perform functions *in addition* to those performed by "blocking nucleic acid" as claimed, or whether the PNAs function in a substantially *different way* from the claimed element. See Ryco, Inc. v. Ag-Bag Corp., 857 F.2d 1418, 1427 (Fed. Cir. 1988);

Insta-Foam Prods., Inc. v. Universal Foam Sys., Inc., 906 F.2d 698, 702 (Fed. Cir. 1990). This is true for PNAs operating alone or as an enriching component with total human DNAs in Dako's products.

The court agrees with plaintiffs that the relevant analysis is "'of the role played by each element in the context of the specific patent claim' . . . not whether the accused element is capable of performing different roles than the claim element in other contexts." Boehringer Ingelheimm Vetmedica, Inc. v. Schering-Plough Corp., 320 F.3d 1339, 1351 (Fed. Cir. 2003), citing Warner-Jenkinson, 520 U.S. at 40. Here, however, genuine issues of fact exist as to whether the accused element performs different roles than the claim element not in other contexts, but in the context of the '841 patent *in situ* hybridization method. While summary judgment of infringement is defeated on this basis, the court notes that this ruling is reflective of the state of briefing on this issue as it came before the court. The disputatiousness of the parties in matters of claim construction led to convoluted briefing on this issue, as the experts were opining based on one claim construction and the attorneys ended up arguing this motion based on another construction of the seminal term at issue for infringement purposes. Moreover, the new stipulation provided that Dako will have the opportunity to supplement its expert declaration (and plaintiffs may conduct further depositions) to address any new written description or enablement issues that arise as a result of the new claim construction. The parties have also stipulated that such new issues will be brought before the jury only, and not raised in pre-trial motions. In finding a true factual dispute as to whether the accused PNAs—alone or in combination with total human DNAs—operate in substantially different ways from the "blocking nucleic acid" as now claimed, it is the court's opinion that this issue must also be submitted to a jury.

In sum, plaintiffs fail to meet their burden of demonstrating the absence of a genuine issue of material fact as to the function-way-result test. As the court has stated previously: "Upon consideration of all available evidence, this question devolves into a form both familiar to—and intractable for—the courts: the cliched 'battle of the experts.'" Ritchie v. U.S., 2004 WL 1161171, *12 (N.D. Cal. 2004) (Patel, J.) As such, and in light of the highly factual nature of equivalency, the court finds that the competing expert testimony offered by the parties renders summary judgment on

this issue unwieldy and fundamentally unworkable. There are genuine issues of material fact as to whether the blocking PNAs of the accused products are interchangeable with and/or function in substantially the same way as, the blocking nucleic acids claimed by the '841 patent. Accordingly, plaintiffs' motion for summary judgment of infringement is **DENIED**.

CONCLUSION

For the foregoing reasons, plaintiffs' motion for summary judgment of infringement of the '841 patent under the doctrine of equivalents is **DENIED**.

IT IS SO ORDERED.

Dated: April 30, 2009

MARILYN HALL PATEL
United States District Court Judge
Northern District of California

ENDNOTES

1. Notably, the parties briefs argue this motion using the prior construction of the claim term "blocking nucleic acid" as being "repetitive-sequence-enriched DNA or RNA." The parties stipulated to proceed with the hearing on this motion for summary judgment even after the stipulated construction had changed to "nucleic acid used to prevent hybridization of repetitive sequences in the labeled nucleic acid to the chromosomal DNA." See Stipulation and Order re Supplemental Claim Construction, Docket No. 351 at 2:16–18 and 6:12–14. At the hearing, the parties argued their positions under the new construction. Suffice to say the dissonance between the parties' written submissions and oral attorney arguments did not serve to simplify the matter before the court. However, in the interests of moving the case forward and in view of the impending trial date only weeks away, the court allowed the motion to be heard in this context and as the parties so desired.

2. Plaintiffs clarified that literal infringement was not being asserted here because, even while the parties now agree that total human DNA falls within the construction of "blocking nucleic acid," it is the mixture of total human DNA with PNA they are alleging infringes the claim and not total human DNA by itself.

3. Again, as part of the parties recent stipulation, the parties agreed that "the opinions in the [Coull Report] that the use of PNA in the accused *HER2 and TOP2A* is not equivalent to the use of "blocking nucleic acid" as claimed in the '841 patent shall apply as well to the use of PNA in Dako's other accused products". See Stipulation and Order re Supplemental Claim Construction, Docket No. 351 at 3:1–4 and 6:25–28.

4. Specifically, plaintiffs state that "the patent is what defines the way in which the 'blocking nucleic acid' works and its alleged equivalents must function, and it is silent on how tightly the probes must hybridize, how long the probes must be, or what specific repetitive sequences must be blocked." See Pl.'s Reply, Docket No. 309, at 8:9–11.